

The Chemical Digestion of Food

Reference: pp. 343-352

Large food particles are broken down into their smaller molecular units by a chemical process called hydrolysis (involves the removal of one molecule of water) through the action of enzymes. Enzymes are protein catalysts.

3 kinds of digestive enzymes:

- 1) carbohydrases
- 2) lipases
- 3) proteinases

Enzymes are usually named for the substrate (the molecule they act on) they break up and they usually end in "-ase".

Examples; maltase breaks down maltose
lactase breaks down lactose

Exceptions to this naming system exist for those discovered many years ago (i.e., pepsin, trypsin and chymotrypsin).

Enzymes are;

- Substrate-specific (only work on a specific molecule)
- Temperature-dependent (only work within a narrow temp. range)
- pH dependent (only work within a narrow pH range)
- Some enzymes require the presence of a "helper" substance like an ion or a coenzyme (i.e., vitamin B12, manganese)

Some specific digestive enzymes:

Mouth - saliva contains amylase which breaks down starch

Stomach - pepsin breaks down proteins

Small intestine - lipase breaks down lipids, trypsin and chymotrypsin break down proteins, maltase, lactase and sucrase break down sugars, etc., etc.

Examine Table 10.1 on page 346.

Accessory Organs to Digestion

Reference: pp. 350-351

Read the above listed pages and create a summary note or a graphic organizer with details about:

- the liver
- the gall bladder
- the pancreas

What roles do they play in digestion? What anatomical features do they have? How are they situated relative to digestive organs?